

## \*\*\*\*\*Wildland Urban Interface Mapping Collaborative Strategy

*D. Sapsis/B. Bahro Briefing Paper, July 2002*

### Background

The National Fire Plan has five key objectives, one being a directed program for reducing wildfire risk to communities near and adjacent to federal lands. Part of the original analysis mandated that the individual states create a list of communities at risk from fire coming off federal lands. California developed the list based on GIS data of population density and a synthetic measure of fire threat (see CDF FRAP 2001). While the list of communities fulfilled the original request at defining the scope of the wildland urban interface (WUI) issue, it has become evident that a more detailed spatial picture of WUI is required, and that additional mapping and analytical work delineating WUI is required for planning and priority setting.

### Objective

Develop a spatial map product for landscape level planning that clearly defines areas constituting human habitation (communities) and an associated “zone of influence” on those communities. Included in the analysis are spatial data characteristics associated with fire risk – estimated fire behavior, fire history, and logical map features that support fire suppression activities.

### Discussion

Community attributes are defined primarily by structure (primary residence) density classes, obtained by clipping census split-blocks to private lands, and populating with the full structure count for that block. This migration process better rectifies actual habitation, particularly in low-density areas where the original census polygon includes a large amount of public lands. The density value for the area is then defined based on the clipped polygon’s area. California Department of Forestry and Fire Protection’s (CDF), Fire and Resource Assessment Program (FRAP) is currently conducting the migration process on the 2000 census data.

### Proposed Density Classes and Naming Convention

| Density Class Table 1 (Being used in Sierra Nevada Framework) |                                     |
|---|-------------------------------------|
| Wildland  | Less than 1 structure per 40 acres. |
| Rural   | 1 per 5 acres -- 1 per 40 acres.    |
| Interface   | 1 per 0.5 acres -- 1 per 5 acres.   |
| Urban   | Greater than 1 house per 0.5 acres. |

| Density Class Table 2 (Being used in CDF FRAP's Forest and Range Assessment) |                                     |
|--|-------------------------------------|
| Wildland   | Less than 1 structure per 20 acres. |
| Rural  | 1 per 5 acres -- 1 per 20 acres.    |
| Interface  | 1 per 1 acre -- 1 per 5 acres.      |
| Urban  | Greater than 1 house per 1 acre.    |

## Proposed methods for defining Zone of Influence around WUI

Two options exist for defining zone of influence:

- 1) Strict Euclidean distance buffer to determine core defense area, and adjacent threat area. This method was used in the Sierra Framework, where the defense zone was the immediate ¼ mile buffer around areas meeting the WUI criteria, and the threat zone an adjacent 1 ¼ mile outer buffer zone. Some isolated small areas of low population density may be filtered out of the WUI buffering routine, to avoid allocating a large zone of influence to small concentration of structures. The filtering model used in the Framework eliminated making buffer zones for areas less than 160 acres and in the lowest density class still considered as WUI (in this case that was up to one house per 40 acres).
- 2) A variable buffer width defined based on a cost function routine in GIS where cost (resistance to width) is determined based on fire behavior attributes such as expected rate of spread or crown fire potential. To generate the fire behavior index, we would use FLAMMAP in conjunction with the statewide surface fuel coverage and characteristic weather regimes to create a grid output of key fire behavior indices. We would then apply the cost function buffering to the index, where more intense behavior results in wider buffer distances. We would likely normalize the cost routine to bracket total buffer distances to 1 – 3 miles.

Both routines would be used to ; 1) develop a zone of influence around communities and 2) give priority to higher populations in the defense zones (the area closest to the structures). That is, when buffers overlap, priority is given to the inner buffer over the outer buffer, and areas adjacent to higher population density are given higher priority over buffers from lower population density. Hence, an outer buffer area arising from an urban area would take priority over an outer buffer coming from a lower density interface area, but would not take priority over an inner buffer area coming from a lower density area (Figure 1).

## DRAFT: WUI and zone of influence

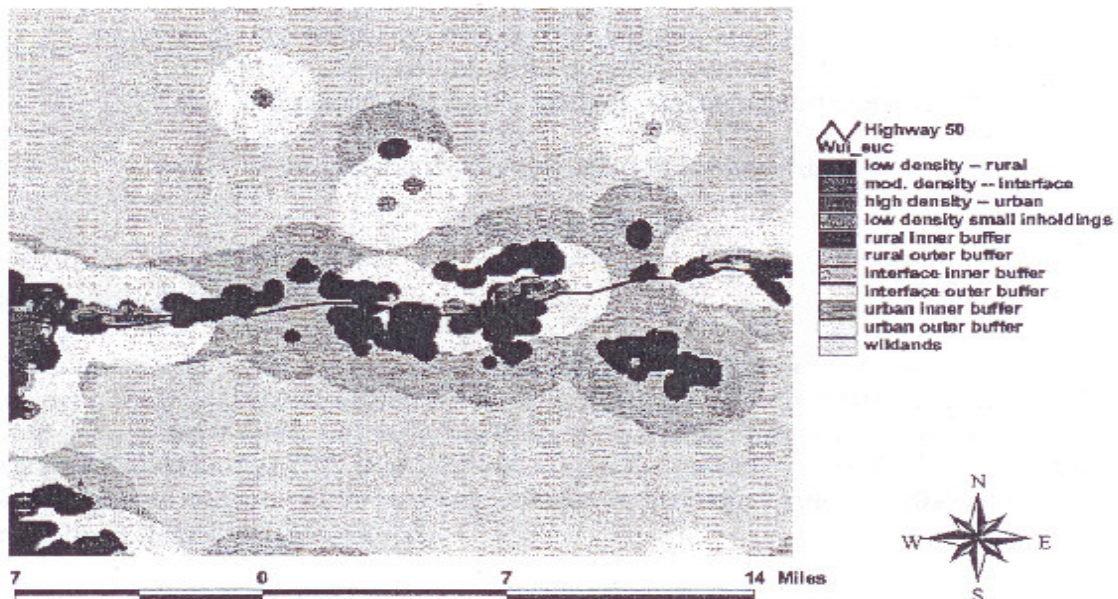


Figure 1. Example of WUI by density and Euclidean distance derived buffered zone of influence.

Community Protection: This Discussion is based on the idea that a community can be defined as a collection of many tangible and intangible parts that are held in common, including both developed areas and wildlands. (Finney 2002 in press)

Examples of community attributes may include:

- Structures, neighborhoods and business
- Infrastructure (roads, bridges, dams, airport, etc)
- Lifestyles and Economy
- Environment (including the natural hazards)



No matter what definition of the Wildland Urban Interface is used, all refer to a geographical area where two diverse systems - forest and urban - meet and interact, giving rise to conflicts concerning management of natural resources.



# Lemhi County Wildland Urban Interface (WUI) Planning Map

